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Technology Plan for the Exploration of the Solar System

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The NASA Office of Space Science, in alliance with the Office of Advanced Concepts and Technology, has developed an Integrated Technology Strategy to guide its investments in technology for space science missions. This strategy establishes goals and strategic objectives that will ensure that NASA and the nation derive the greatest possible scientific and economic benefits from investments in space science missions and technologies. Within the Office of Space Science, the Solar System Exploration Division is developing a Technology Plan to implement these goals and to identify specific technology needs and benefits for solar system missions. This paper describes the philosophy and processes being established for the systematic identification of technologies and the resources to develop them. The current technology needs and priorities, and their applications to current and planned missions, are also discussed.

The Technology Plan must ensure that the required technologies are available in time for inclusion in **individual flight projects**. A **vigorous program** of Advanced Technology Development, making extensive use of testbeds and technology flight experiments, is a key feature and will reduce the cost and risk of applying new technologies to science missions. Another important characteristic of the plan is its robustness to possible changes in the mission set as space science priorities and budgets evolve. This will provide a stable environment for technology planning and will enhance the efficiency of applied technology research and advanced development. The Plan provides context not only for the infusion of new technologies into science missions, but also for their transfer to private industry. This is done through the use of "implementing partnerships" during the later stages of technology development and validation.

The scope of the Solar System Exploration Division Technology Plan encompasses all major elements of flight missions, including spacecraft, instruments, and ground systems. Priorities and development plans are articulated according to the broad classes of missions that presently reflect the top science priorities; these are Mars Exploration, Discovery, Outer Planets, Extra-Solar Planetary Systems, and Far-Term Missions.